

- 3 -

Remarks

This application has been reviewed in light of the Office Action of April 17, 2003. Claims 1-18 are pending, and all claims stand rejected. In response, claims 1 and 11 are amended; and the following remarks are submitted. Reconsideration of this application, as amended, is requested.

The claims are objected to on two grounds, as discussed next.

Claims 1 and 11 are objected to on the ground that it is unclear if "...Schottky diode connected between the anode and the cathode" refers to the same cell or to different cells. From the rules of claim construction, it is quite clear that these must be the anode and cathode of the same electrochemical cell. Applicant has amended claim 1 in response to the rejection to restate the matter that is clear from the claim construction. This amendment to claim 1 does not alter its scope. Claim 11 does not present this issue at all, however.

Claim 11 is objected to on the grounds of "element" as distinct from "compound". Applicant proposes to change "element" to the more-generic "material". "Compound" is not precisely correct, because the listed combinations of elements do not necessarily form compounds in the usual sense. Applicant submits that "and combinations thereof" is not redundant, because the modified lithium metal oxide might include, for example, a mixture of lithium nickel oxide and lithium nickel aluminum oxide.

Applicant asks that the Examiner reconsider and withdraw this objection.

Claims 1-6, 8, 9, and 12-18 are rejected under 35 USC 103 over Kawano '946 in view of Young '789. Applicant traverses this ground of rejection.

The following principle of law applies to all sec. 103 rejections. MPEP 2143.03 provides "To establish prima facie obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art. In re Royka, 490 F2d 981, 180

- 4 -

USPQ 580 (CCPA 1974). All words in a claim must be considered in judging the patentability of that claim against the prior art. In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)." [emphasis added] That is, to have any expectation of rejecting the claims over a single reference or a combination of references, each limitation must be taught somewhere in the applied prior art. If limitations are not found in any of the applied prior art, the rejection cannot stand. In this case, the applied prior art references clearly do not arguably teach some limitations of the claims.

Claim 1 recites in part:

"a Schottky diode connected between the anode and the cathode of the electrochemical cell"

Kawano has no such teaching. Young discloses a battery structure wherein "The positive terminal side of battery cell core 301 is coupled to an input of Schottkey [sic] diode 302." (col. 4, lines 58-59). The Schottky diode is connected across a charging FET 306 (col. 4, lines 55-56), but not across the battery cell core 301. The output of the Schottky diode is then coupled through a current sensor 303 to the positive battery terminal 305. That is, as is clear from Figure 3 of Young, the Schottky diode is entirely on the positive side of the battery cell core 301, and is not connected between the anode and the cathode of the battery cell core 301.

The reference at col. 8, lines 28-33 of Young to avoiding unbalanced cells must be read in the overall context of that statement and its reference to the use of the microprocessor 304 (col. 4, line 67-col. 5, line 1). See the statement at page 2, lines 12-15 of the present application, "The approach of the invention requires the addition of only a small, lightweight component to the weight of the cells themselves, and avoids the need for active charge balancing apparatus and circuitry." The microprocessor 304 of Young is just such "active charge balancing apparatus and circuitry". And, in any event, whether Young achieves a desirable result or not, the Schottky diode depicted by Young is not "connected between the anode and the cathode" of the battery cell core 301.

- 5 -

Claim 12 recites in part:

"a cell current bypass connected between the anode and the cathode, the cell current bypass conducting current between the anode and the cathode to short circuit the electrochemical cell only at voltages more negative than the negative bypass voltage"

Kawano has no such teaching. Young has no such teaching, and in particular Young has no cell current bypass connected between the anode and the cathode of the battery cell core 301. Young has no structure connected between the anode and the cathode of the battery cell core 301.

Claim 15 recites in part:

"a Schottky diode connected between the anode and the cathode"

Kawano has no such teaching. Young has no such teaching, and in particular Young has no Schottky diode connected between the anode and the cathode of the battery cell core 301.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

Claims 7 and 10 are rejected under 35 USC 103 over Kawano in view of Young, and further in view of Okada '836.

Claims 7 and 10 depend from claim 1. Kawano and Young do not teach the limitations of claim 1 for the reasons stated above, which are incorporated here, and Okada adds nothing in this regard.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

Claims 1, 2, 3, 5, 6, 8, 9, and 11-17 are rejected under 35 USC 103 over Maeda

- 6 -

'930 in view of Young '789. Applicant traverses this ground of rejection.

Claim 1 recites in part:

"a Schottky diode connected between the anode and the cathode of the electrochemical cell"

Maeda has no such teaching. Young discloses a battery structure wherein "The positive terminal side of battery cell core 301 is coupled to an input of Schottkey [sic] diode 302." (col. 4, lines 58-59). The Schottky diode is connected across the terminals of a charging FET 306 (col. 4, lines 55-56). The output of the Schottky diode is then coupled through a current sensor 303 to the positive battery terminal 305. That is, as is clear from Figure 3 of Young, the Schottky diode is entirely on the positive side of the battery cell core 301, and is not connected between the anode and the cathode of the battery cell core 301.

The reference at col. 8, lines 28-33 of Young to avoiding unbalanced cells must be read in the overall context of that statement and its reference to the use of the microprocessor 304 (col. 4, line 67-col. 5, line 1). See the statement at page 2, lines 12-15 of the present application, "The approach of the invention requires the addition of only a small, lightweight component to the weight of the cells themselves, and avoids the need for active charge balancing apparatus and circuitry." The microprocessor 304 of Young is just such "active charge balancing apparatus and circuitry". And, in any event, whether Young achieves a desirable result or not, the Schottky diode depicted by Young is not "connected between the anode and the cathode" of the battery cell core 301.

Claim 12 recites in part:

"a cell current bypass connected between the anode and the cathode, the cell current bypass conducting current between the anode and the cathode to short circuit the electrochemical cell only at voltages more negative than the negative bypass voltage"

- 7 -

Maeda has no such teaching. Young has no such teaching, and in particular Young has no cell current bypass connected between the anode and the cathode of the battery cell core 301. Young has no structure connected between the anode and the cathode of the battery cell core 301.

Claim 15 recites in part:

"a Schottky diode connected between the anode and the cathode"

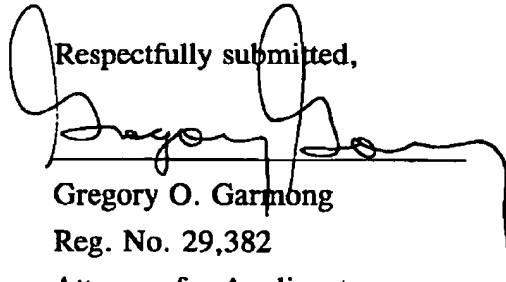
Maeda has no such teaching. Young has no such teaching, and in particular Young has no Schottky diode connected between the anode and the cathode of the battery cell core 301.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

Applicant submits that the application is now in condition for allowance, and requests such allowance.

I hereby certify that this paper (eight pages total) is being facsimile transmitted to the Patent and Trademark Office at fax 703-872-9310 on May 27, 2003.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Gregory O. Garmong", is written over a horizontal line. The signature is stylized with loops and a long trailing line extending to the right.

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- 8 -

VERSION WITH MARKINGS TO SHOW CHANGES MADE

underlined material is to be inserted, [bracketed] material is to be deleted, and --material set off by dashes-- is to be added.

Claims:

1. (Amended) An electrochemical battery comprising at least two electrically interconnected electrochemical cells, each electrochemical cell comprising:
an anode comprising carbon;
a cathode comprising a modified lithium metal oxide including at least one additional element selected from the group consisting of nickel, aluminum, magnesium, titanium, and combinations thereof; and
a Schottky diode connected between the anode and the cathode of the electrochemical cell.

11. (Amended) The battery of claim 1, wherein the modified lithium metal oxide comprises a combination of [elements] materials selected from the group consisting of lithium nickel oxide, lithium nickel aluminum oxide, lithium nickel cobalt oxide, lithium nickel cobalt oxy-fluoride, lithium nickel cobalt aluminum oxide, lithium nickel cobalt iron oxide, lithium nickel cobalt manganese oxide, lithium nickel cobalt manganese aluminum oxide, and lithium nickel cobalt titanium magnesium oxide, and combinations thereof.